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Claims (EP)

1.   A method of transmitting (2000) a data packet on a
communication path from a first communication node to a
5   second communication node in a mobile network, the method
characterised by the steps of:
        receiving a route message from said second
communication node, wherein said route message includes a
list of a plurality of intermediary addresses between
10 said first communication node and said second
communication node, the plurality of intermediary
addresses comprising an address of a mobile router;
        generating (3014, 3038) a preferred communication
path in response to said list of intermediary addresses;
15 and
        transmitting (2050) said at least one data packet
from said first communication node to said second
communication node via said preferred communication path.

20 2.   The method of transmitting a data packet according
to Claim 1, wherein said data communication network
supports nested network mobility operation and said step
of transmitting includes the step of:
        routing said at least one data packet via a
25 plurality of mobile routers identified by said
intermediary addresses in said nested mobility network.

3.   The method of transmitting a data packet according
to Claim 1 or Claim 2, wherein said data communication
30 network operates in accordance with an IPv6 and/or IPv4
specification.

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4.   The method of transmitting a data packet according
to any preceding Claim, wherein said first communication
node is a correspondent node of the said second
communication node and/or said second communication node
5   is a mobile network node.

5.   The method of transmitting a data packet according
to any preceding Claim, the method further characterised
by the step of:
10   sending an advertising message, by a plurality of
communication nodes in the mobile network, that includes
route information related to communication nodes attached
to said second communication node, so that a
communication path to an intended recipient can be
15 determined.

6.   The method of transmitting a data packet according
to any preceding Claim, wherein said list of the
plurality of intermediary addresses includes addresses of
20 one or more mobile routers above the second communication
node in a route hierarchy for delivering said data packet
to an intended recipient.

7.   The method of transmitting a data packet according
25 to Claim 5 or Claim 6, the method further characterised
by the step of:
requesting transmission of one or more
advertisement messages, containing route information of
one or more IP addresses, from adjacent communication
30 nodes when said second communication node moves to a new
location within the mobile network.

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8.   The method of transmitting a data packet according
to any of preceding Claims 5 or 7, the method further
characterised by the steps of:
        extracting intermediary route messages from said
5   route information in said advertising message at a
communication node; and
        transmitting said intermediary route messages to
communication nodes that the extracting communication
node serves.
10

9.   The method of transmitting a data packet according
to Claim 8, the method further characterised by the step
of:
        appending a route message of the communication
15   unit to said list of intermediary routes in said
advertising message at said communication node.

10.   The method of transmitting a data packet according
to any of preceding Claims 5 or 7 to 9 further
20   characterised by the step of:
        sending periodically said route advertising
message to all or a selected number of communication
nodes in the mobile network.

25   11.   The method of transmitting a data packet according
to any of preceding Claims 5 or 7 to 10, the method
further characterised by the step of:
        sending a mobile network prefix advertisement
message by a mobile router at a top of a routing
30   hierarchy in the mobile network to advertise said mobile
network prefix; and

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determining by communication nodes in the same
mobile network that they are located within the sending
mobile router's mobile network.

5   12.   The method of transmitting a data packet according
to any of preceding Claims, the method further
characterised by the step of:
        sending an extended binding update message
containing route information only to communication nodes
10   outside of the sending communication node's mobile
network.

13.   A communication message (2600, 2700) having route
information that includes an ordered list of a plurality
15   of intermediary addresses comprising at least one address
of a mobile router between a first communication node and
a second communication node, for use in the method of any
of preceding Claims 1 to 12.

20   14.   A communication message (2500) that includes a
plurality of intermediary routes or intermediary source
routes corresponding to a respective plurality of mobile
routers to be used to forward said data packet to said
intended recipient.
25

15.   The communication message according to Claim 14,
wherein said message is a mobile network prefix
advertisement message (2300).

30   16.   A communication message including a request (2200,
2400) for a communication message according to Claim 14
or Claim 15.

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17.   A communication node comprising:

an interface for communicating with other

communication nodes, for example in a mobile network;

5   the communication node characterised by:

a memory element storing an extended binding cache

containing routes and/or source route information

relating to a plurality of communication nodes, for

example nodes in the mobile network;

10   a processor, operably coupled to said memory

element, for generating a route, based on information

stored in the extended binding cache; and

a transmitter, operably coupled to said processor,

for delivering a data packet to an intended recipient via

15   said route.

18.   A communication node comprising:

an interface for communicating with other

communication nodes, for example in a mobile network;

20   the communication node characterised by:

a receiver operably coupled to said interface,

receiving an extended binding update message containing

route information relating to a communication node in the

mobile network; and

25   a processor, operably coupled to said receiver,

for generating a care of source route message, based on

information contained in the extended binding update

message, the care of source route message comprising an

intermediary address of a mobile router.

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19.   A storage medium (2800) storing care of source route information, in accordance with any of the preceding Claims.

5   20.   A method for building an extended binding cache at a first communication node, the method characterised by the steps of:

receiving, from a second communication node, an extended binding update message indicating a plurality of
10 intermediary addresses in a route for messages to reach said second communication node, the plurality of intermediary addresses comprising an address of a mobile router;

comparing said intermediary addresses of said
15 extended binding update message with intermediary addresses of the first communication node's route messages;

extracting at least one subsequent route message of said second communication node, when said comparison
20 fails to yield a match following previous route matches, thereby generating an extended binding cache entry indicating an improved route to said second communication node.

25 21.   A method for constructing and sending (700, 800, 900) a care-of route advertising message at a mobile network node, the method characterised by the steps of:

building (750, 850, 950) a care-of route advertisement message including a Care-of Route of said
30 mobile network node; and

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sending (760, 860, 960) the care-of route
advertisement message to all nodes operably coupled to
mobile network node;
wherein said steps of building and sending are initiated
5   by one of the following:
        receiving (720) an advertisement message according
to Claim 14 or Claim 15; or
        receiving (920) a request for an advertisement
message according to Claim 16; or
10   responding (820) to a time-out of an advertising
message time.

22.   A method (1700, 1800, 1900) for constructing and
sending mobile network prefix advertising message at a
15 mobile router, the method characterised by the steps of:
        building (1725, 1815, 1920) a mobile network
prefix advertising message including a mobile network
prefix and a mobile network prefix length; and
        sending (1730, 1820, 1925) the mobile network
20 prefix advertising message to all nodes operably coupled
to said mobile router;
wherein said steps of building and sending are initiated
by one of the following:
        receiving (1710) an mobile network prefix
25 advertising message according to Claim 15; or
        receiving (1910) a request for an mobile network
prefix advertising message according to Claim 16; or
        responding (1810) to a time-out of a mobile
network prefix advertising message time.
30

23.   A storage medium (665) storing processor-
implementable instructions for controlling a processor to

carry out the method of any of claims 1 to 12, 20, 21 or 22.

24.   Apparatus adapted to perform the method of any of
5   any of claims 1 to 12 or 16.

25.   A communication unit comprising apparatus according to Claim 24.

10   26.   A communication system comprising a communication unit according to Claim 25 or apparatus according to Claim 26.